Space Weather Forecast

Issued on Sunday, 02 April 2023 at 00:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor Geomagnetic Storms throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with only Common-class flares observed. There are currently two numbered and one unnumbered sunspot regions on the disc. All appear to be small and simple with very little magnetic complexity. No Earth directed Coronal Mass Ejections (CMEs) have been detected in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind was characterised by the fast wind associated with ongoing coronal hole influence. Solar wind speeds were Slightly Elevated to Elevated. The Interplanetary magnetic field was weak, with fluctuations within the important north-south component also weak. The result of the above solar wind measures was for Quiet to Unsettled (Kp 1-3) geomagnetic activity, with one Active interval (Kp 4) 01/1500-01/1800 UTC.

Energetic Particles / Solar Radiation: High energy proton enhancement (greater than 10MeV) has been at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low, though confidence reduces through the period.

Solar Wind / Geomagnetic Activity: No Earth Directed CMEs (coronal mass ejections) are expected, though there have been multiple small but complex CMEs within the last few days, with a very slight chance of glancing blows at Earth during Days 1 and 2.

Solar wind speeds currently at Elevated levels, and a generally Slightly Elevated to Elevated speed flow looks likely to persist through Days 1 and 2, complicated by any transitory CME impacts. During Day 3 and into Day 4 Earth will likely see the effect of approaching coronal holes 89 and 90, with coronal hole 90 in the southern hemisphere expected to be the dominate feature. Solar wind speeds expected to rise to Elevated or perhaps Strong levels.

Generally Quiet to Unsettled geomagnetic activity is expected, with Active intervals likely and a chance of G1/Minor Storm intervals due to continued fast winds and possible transitory CME effects. Into Day 2 and Day 3, Unsettled to Active geomagnetic activity is expected, with a chance of G1/Minor storming due to the likely arrival of coronal hole 90 and the continuing risk of CME glancing blows.

Energetic Particles / Solar Radiation: No solar radiation storms are expected through the period.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	50	50	30
Strong	G3	No	1	5	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	5	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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